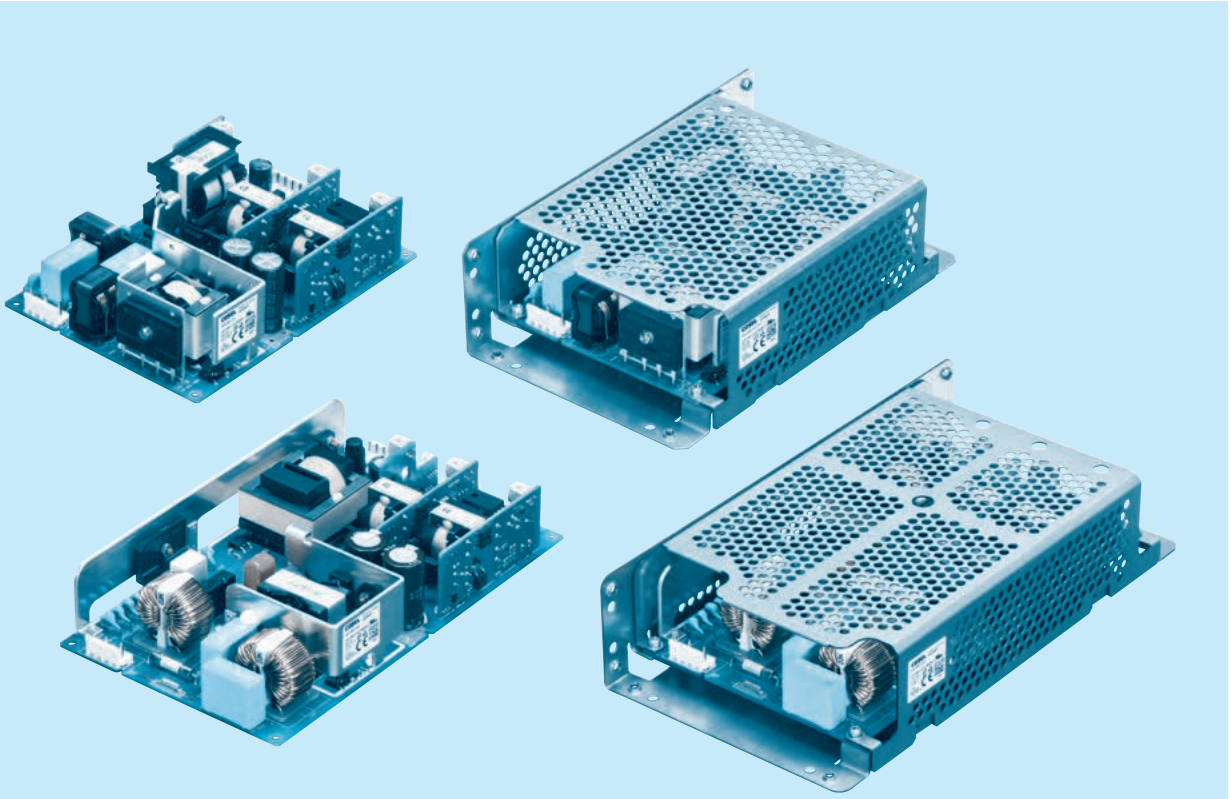
COSEL

Power Factor Correction | World wide | Safety Approvals | EMI | Inrush current limiting | OCP | OVP | 1U | Modular

RB-series



The RB series has Order Name which is used for the ordering aside from Model Name.

Feature

Configurable type power supply
Multiple outputs combination (driving and control systems) for robot controller applications
Meets OVC III (Complies with EN60204-1)
Reinforced isolation between SLOT 3 and SLOT 1, 2

Safety agency approvals

UL62368-1
C-UL (CAN/CSA-C22.2 No.62368-1)
EN62368-1
EN62477-1 (OVC III)
Complies with EN61558-2-16 (OVC III)

5-year warranty (Refer to Instruction Manual)

CE marking

Low Voltage Directive
RoHS Directive

EMI

Complies with FCC-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, VCCI-B

EMS Compliance : EN61204-3, EN61000-6-2

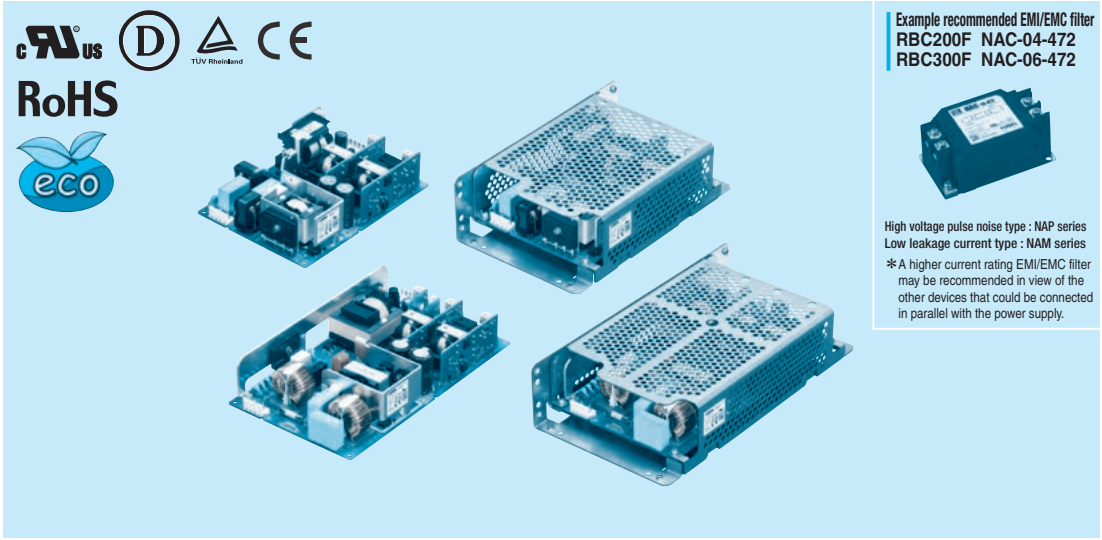
EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11

COSEL AC-DC Power Supplies Configurable Type

RB-series

Model name configuration

RB ① C ② □□□ ③ F ④ - □□□ ⑤⑥⑦ - □ ⑧



Example recommended EMI/EMC filter
RBC200F NAC-04-472
RBC300F NAC-06-472

High voltage pulse noise type : NAP series
Low leakage current type : NAM series
＊A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

① Series name
② Multiple output
③ Abbreviation power of RB series
200 : 207W
300 : 303W
④ Universal input
⑤ Slot 3 module code
⑥ Slot 2 module code
⑦ Slot 1 module code
⑧ Optional ＊6
C : with Coating
G : Low leakage curent
R : with Remote ON/OFF
S : with Chassis
SN : with Chassis & cover
T : Vertical terminal block
U1 : can attach an external capacitor unit
I3 : with Extended-UART interface

Specification changes when options are added. Please refer to the instruction manual 9.1.

＊This power supply is manufactured by SMD technology. The stress to P.C.B like twisting or bending causes the defects to the unit, so handle the unit with care.
The RB series has Order Name which is used for the ordering aside from Model Name.

SPECIFICATIONS

	MODEL		RBC200F	RBC300F
INPUT	VOLTAGE [VAC] ＊1		85 - 264 1φ	
	CURRENT [A] ＊2	ACIN 100V	2.4typ	3.6typ
		ACIN 230V	1.1typ	1.6typ
	FREQUENCY [Hz]		50/60 (45 - 66)	
	EFFICIENCY [%] ＊2	ACIN 100V	89.5typ	90.0typ
		ACIN 230V	91.0typ	92.0typ
	POWER FACTOR ＊2	ACIN 100V	0.99typ	
		ACIN 230V	0.93typ	
	INRUSH CURRENT [A] ＊2 ＊3	ACIN 100V	15typ	
		ACIN 230V	30typ	
	LEAKAGE CURRENT [mA]		0.40 / 0.75max (ACIN 100/240V 60Hz, Io=100%, According to IEC62368-1)	
OUTPUT	NUMBER OF SLOT		3	
	TOTAL OUTPUT [W]		207	303 (peak 423)
	START-UP TIME [ms] ＊2		350typ (ACIN 100V)	
	HOLD-UP TIME [ms] ＊2		20typ (ACIN 100V)	25typ (ACIN 100V)
FUNCTION	REMOTE ON/OFF		Optional R (Refer to Instruction Manual)	
ISOLATION	INPUT - OUTPUT, RC ＊4 ＊7		AC3,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)	
	INPUT - FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)	
	OUTPUT - FG	V3 - FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)	
		V1, V2, RC - FG ＊7	AC 500V 1minute, Cutoff current = 100mA, DC500V 100MΩ min (At Room Temperature)	
	OUTPUT - OUTPUT	V1, V2, RC - V3 ＊7	AC3,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)	
		V1 - V2	AC 500V 1minute, Cutoff current = 100mA, DC500V 100MΩ min (At Room Temperature)	
		V1, V2 - RC ＊7	AC 100V 1minute, Cutoff current = 100mA, DC500V 100MΩ min (At Room Temperature)	
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE ＊1		-20 to +70℃, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max	
	STORAGE TEMP.,HUMID.AND ALTITUDE		-30 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max	
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis	
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis	
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL62368-1, C-UL(equivalent to CAN/CSA-C22.2 No.62368-1), EN62368-1, EN62477-1 (OVC III), Complies with EN61558-2-16 (OVC III)	
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B	
	HARMONIC ATTENUATOR ＊5		Complies with IEC61000-3-2 (class A)	
OTHERS	SIZE		101×38.3×152mm (W×H×D) [3.98×1.5×5.98 inches], with terminal block 101×38.3×164mm (W×H×D) [3.98×1.5×6.46 inches]	114×38.3×203mm (W×H×D) [4.49×1.5×7.99 inches]
	WEIGHT [g]		450max	710max
	COOLING METHOD ＊1		Convection / Forced air (Refer to “Derating”)	

＊1 Derating is required.
＊2 The value depends on output modules and their combinations.
RBC200F : The value at 200W output. RBC300F : The value at 300W output.
＊3 More than 3 sec, to re-start.
＊4 Values when V1, V2 and V3 are all shorted.
＊5 Please contact us about another class.
＊6 Specification is changed at option, please contact us for detail.
＊7 This specifications of “ALM, INFO” are the same as RC.
＊8 Applicable when Remote ON/OFF (optional) is added.
＊ To meet the specifications. Do not operate over-loaded condition.
＊ Parallel operation is not possible.
＊ Sound noise may be generated by power supply in case of pulse load.

Output module specifications

		RBC200F dedicated output module				RBC300F dedicated output module		
		Slot 1 140W suitable single output				Slot 1 240W suitable single output		
ITEM	CODE	V	W	Y	Z	S	T	U
Number of slots used		1	1	1	1	1	1	1
VOLTAGE [V]		+12	+15	+24	+48	+12	+24	+48
MINIMUM CURRENT [A]		0	0	0	0	0	0	0
CURRENT [A]		10	8.5	6	3	16	10	5
PEAK CURRENT [A]		-	-	-	-	-	15	7.5
MAX OUTPUT WATTAGE [W]		120	127.5	144	144	192	240	240
LINE REGULATION [mV] max		48	60	96	192	48	96	192
LOAD REGULATION [mV] max		100	120	150	240	100	150	240
RIPPLE [mVp-p] max	0 to +50℃	120	120	120	380	120	120	300
∗1	-20 to 0℃	240	240	240	480	240	240	360
RIPPLE NOISE [mVp-p] max	0 to +50℃	150	150	150	480	150	150	360
∗1	-20 to 0℃	300	300	300	580	300	300	450
TEMPERATURE	0 to +50℃	120	150	240	480	120	240	480
COEFFICENT [mV] max	-20 to +50℃	150	180	290	600	150	290	600
DRIFT [mV] max	∗4	48	60	96	192	48	96	192
OUTPUT VOLTAGE SETTING [V]		12.00 to 12.48	15.00 to 15.60	24.00 to 24.96	48.00 to 49.92	12.00 to 12.48	24.00 to 24.96	48.00 to 49.92
OUTPUT VOLTAGE ADJUSTMENT RANGE [V]		11.40 to 13.20	14.25 to 16.50	22.80 to 26.40	45.60 to 52.80	11.40 to 13.20	22.80 to 26.40	45.60 to 52.80
OVERCURRENT PROTECTION [A]	∗6	Works over 105% min of rated current. Automatic recovery.				Works over 105% min of rated current or 101% min of peak current. Automatic recovery.		
OVERVOLTAGE PROTECTION [V]		14.40 to 17.40	18.00 to 21.75	28.80 to 34.80	57.60 to 67.20	14.40 to 17.40	28.80 to 34.80	57.60 to 67.20

		RBC200F/RBC300F common output module				
		Slot 2, Slot 3 15W suitable single output			Slot 2 15W suitable dual output	
ITEM	CODE	B	C	D	E	F
Number of slots used		1	1	1	1	1
VOLTAGE [V]		+5	+12	+24	±12	±15
MINIMUM CURRENT [A]		0	0	0	0	0
CURRENT [A]		3	1.3	0.65	0.6	0.5
MAX OUTPUT WATTAGE [W]		15	15.6	15.6	14.4	15
LINE REGULATION [mV] max		20	48	96	48	60
LOAD REGULATION [mV] max	∗5	40	100	150	600	650
RIPPLE [mVp-p] max	0 to +50℃	80	120	120	120	120
∗1	-20 to 0℃	140	160	160	160	160
RIPPLE NOISE [mVp-p] max	0 to +50℃	120	150	150	150	150
∗1	-20 to 0℃	160	180	180	180	180
TEMPERATURE	0 to +50℃	50	120	240	120	150
COEFFICENT [mV] max	-20 to +50℃	60	150	290	150	180
DRIFT [mV] max	∗4	20	48	96	48	60
OUTPUT VOLTAGE SETTING [V]		5.00 to 5.20	12.00 to 12.48	24.00 to 24.96	12.00 to 12.48	15.00 to 15.60
OUTPUT VOLTAGE ADJUSTMENT RANGE [V]		4.50 to 5.50	10.80 to 13.20	21.60 to 26.40	10.80 to 13.20	13.50 to 16.50
OVERCURRENT PROTECTION [A]	∗6	Works over 105% min of rated current. Automatic recovery.				
OVERVOLTAGE PROTECTION [V]		5.75 to 8.00	13.80 to 19.20	28.80 to 38.40	13.80 to 19.20	17.25 to 24.00

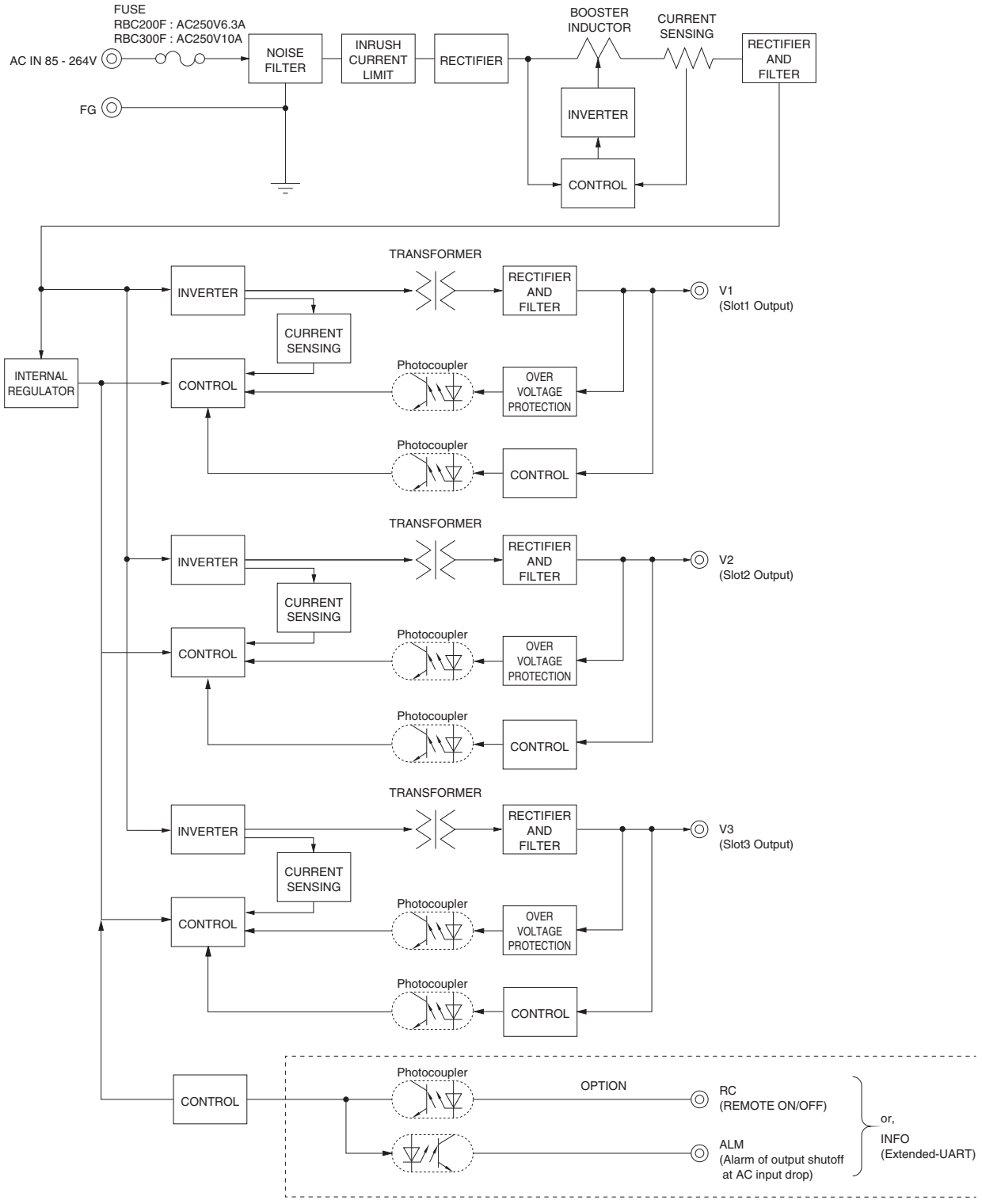
		RBC200F/RBC300F common output module							
		Slot 2, Slot 3 30W suitable single output						Slot 2 30W suitable dual output	
ITEM	CODE	G	H	J	K	L	M	P	Q
Number of slots used		1	1	1	1	1	1	1	1
VOLTAGE [V]		+3.3	+5	+12	+16.5	+24	+48	±12	±15
MINIMUM CURRENT [A]		0	0	0	0	0	0	0	0
CURRENT [A]		5	5	2.5	1.9	1.3	0.65	0.7	0.7
MAX OUTPUT WATTAGE [W]		16.5	25	30	31.4	31.2	31.2	16.8	21
LINE REGULATION [mV] max		20	20	48	66	96	192	48	60
LOAD REGULATION [mV] max	∗5	40	40	100	120	150	240	600	650
RIPPLE [mVp-p] max	0 to +50℃	80	80	120	120	120	150	120	120
∗1 ∗2	-20 to 0℃	140	140	160	160	160	250	160	160
RIPPLE NOISE [mVp-p] max	0 to +50℃	120	120	150	150	150	250	150	150
∗1 ∗3	-20 to 0℃	160	160	180	180	180	350	180	180
TEMPERATURE	0 to +50℃	50	50	120	165	240	480	120	150
COEFFICENT [mV] max	-20 to +50℃	60	60	150	200	290	600	150	180
DRIFT [mV] max	∗4	20	20	48	66	96	192	48	60
OUTPUT VOLTAGE SETTING [V]		3.30 to 3.40	5.00 to 5.20	12.00 to 12.48	16.50 to 17.16	24.00 to 24.96	48.00 to 49.92	12.00 to 12.48	15.00 to 15.60
OUTPUT VOLTAGE ADJUSTMENT RANGE [V]		2.97 to 3.63	4.50 to 5.50	10.80 to 13.20	14.85 to 18.15	21.60 to 26.40	43.20 to 52.80	10.80 to 13.20	13.50 to 16.50
OVERCURRENT PROTECTION [A]	∗6	Works over 105% min of rated current. Automatic recovery.							
OVERVOLTAGE PROTECTION [V]		4.00 to 5.25	5.75 to 7.00	13.80 to 16.80	18.90 to 23.10	28.80 to 34.80	57.60 to 67.20	14.40 to 18.00	18.00 to 22.50

∗1 This is the value that measured on measuring board with capacitor of 22μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
∗2 At the G module, ripple is 120 mV(Ta=0 to 50℃) 160 mV(Ta=-20 to 0℃) at 5% or less load because of reduction of standby power.
∗3 At the G module, ripple noise is 160mV(Ta=0 to 50℃) 200mV(Ta=-20 to 0℃) at 5% or less load because of reduction of standby power.
∗4 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, with the input voltage held constant at the rated input/output.
∗5 Figures for 0 to rated current.The current not measured side is rated current. (module E, F, P, Q).
∗6 The output is shut down when the overcurrent state continues for 5 minutes.
∗ To meet the specifications. Do not operate over-loaded condition.
∗ Parallel operation is not possible.
∗ Sound noise may be generated by power supply in case of pulse load.

Features

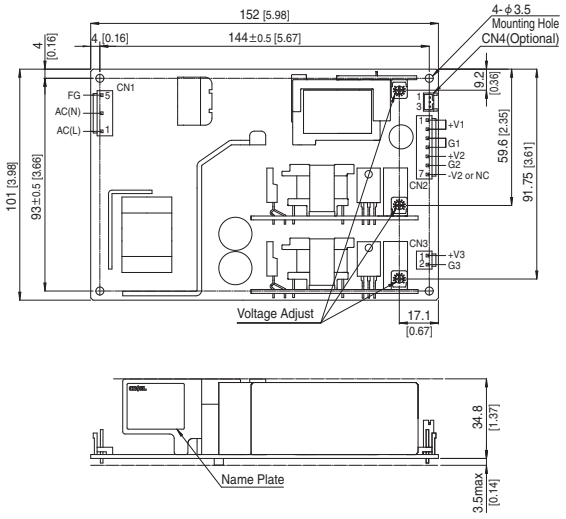
- Configurable type power supply
- Multiple outputs combination (driving and control systems) for robot controller applications
- Meets OVC III (Complies with EN60204-1)
- Reinforced isolation between SLOT 3 and SLOT 1, 2
- Remote control function (optional)

Block diagram



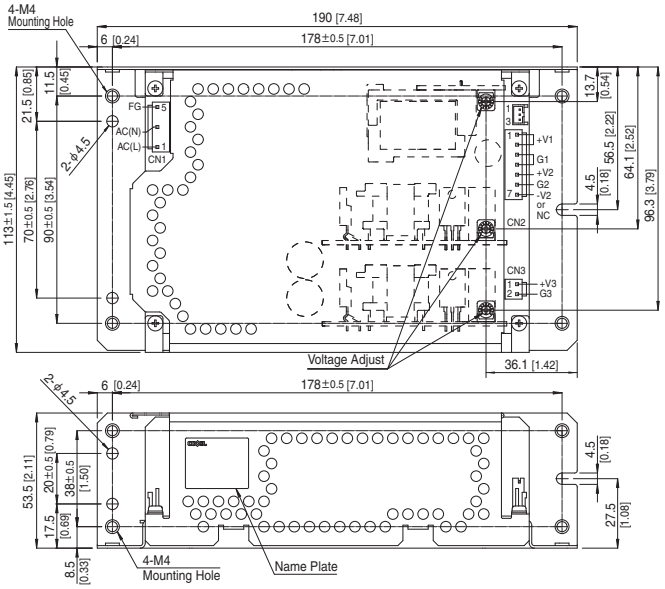
RBC200F external view

Standard type



※ Tolerance : ±1 [±0.04]
※ Weight : 450g max
※ There are a total of four attachment holes.
※ Dimensions in mm, [ ]=inches
※ Mounting torque : 0.6N·m max
※ PCB Material / thickness : FR-4 / 1.7mm [0.07]

Chassis and cover type



※ Tolerance : ±1 [±0.04]
※ Weight : 820g max
※ There are a total of four attachment holes.
※ Dimensions in mm, [ ]=inches
※ Mounting torque (Mounting hole of chassis) : 1.5N·m max
※ PCB Material / thickness : FR-4 / 1.7mm [0.07]

I/O Connector		Mating connector	Terminal
CN1	B3P5-VH	VHR-5N	Chain : SVH-21T-P1.1
			Loose : BVH-21T-P1.1
CN2	B7P-VH	VHR-7N	Chain : SVH-21T-P1.1
			Loose : BVH-21T-P1.1
CN3	B2P-VH	VHR-2N	Chain : SVH-21T-P1.1
			Loose : BVH-21T-P1.1
CN4 Optional	BH3B-PH	PHR-3	Chain : SPH-002T-P0.5S
			Loose : BPH-002T-P0.5S

(Mfr : J.S.T.)

CN1

Pin No.	Input
1	AC (L)
2	-
3	AC (N)
4	-
5	FG

CN2

Pin No.	Output
1	+V1
2	+V1
3	G1
4	G1
5	+V2
6	G2
7	NC or -V2

CN3

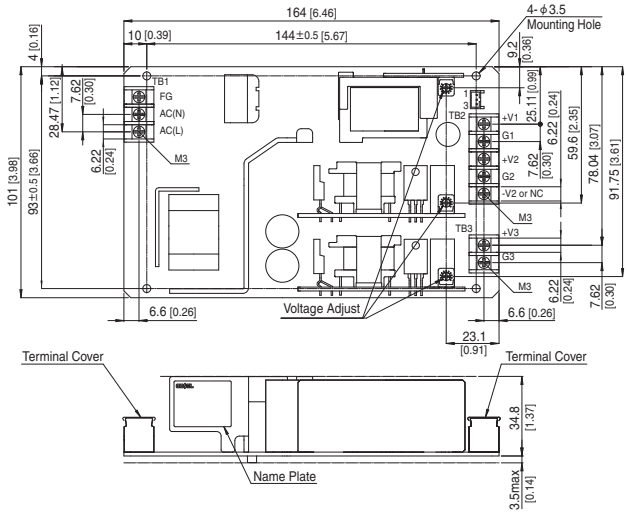
Pin No.	Output
1	+V3
2	G3

CN4 (Optional)

Pin No.	Function
1	※1
2	
3	

※1 The function of CN4 varies depending on optional. Please refer to the instruction manual.
※ Pin no.2 and 4 is NC at CN1.
※ Maximum current per contact at CN2 is 5A.
※ Pin no.7 of CN2 is NC when slot 2 module is single output.

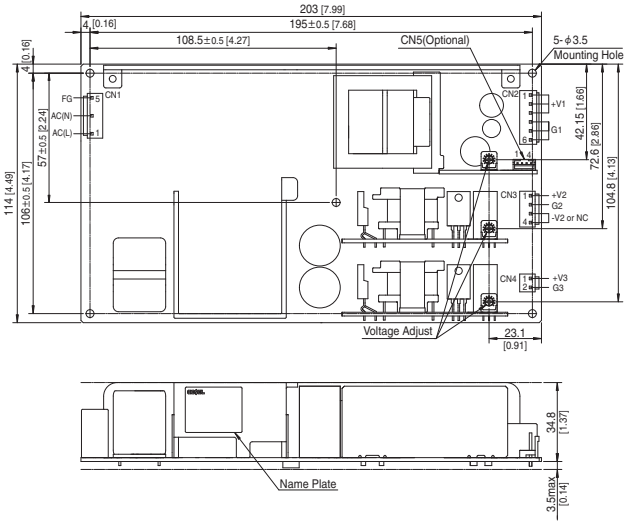
Vertical terminal block type



※ Tolerance : ±1 [±0.04]
※ Weight : 470g max
※ There are a total of four attachment holes.
※ Dimensions in mm, [ ]=inches
※ Screw tightening torque : 0.8N·m max
※ Mounting torque : 0.6N·m max
※ PCB Material / thickness : FR-4 / 1.7mm [0.07]

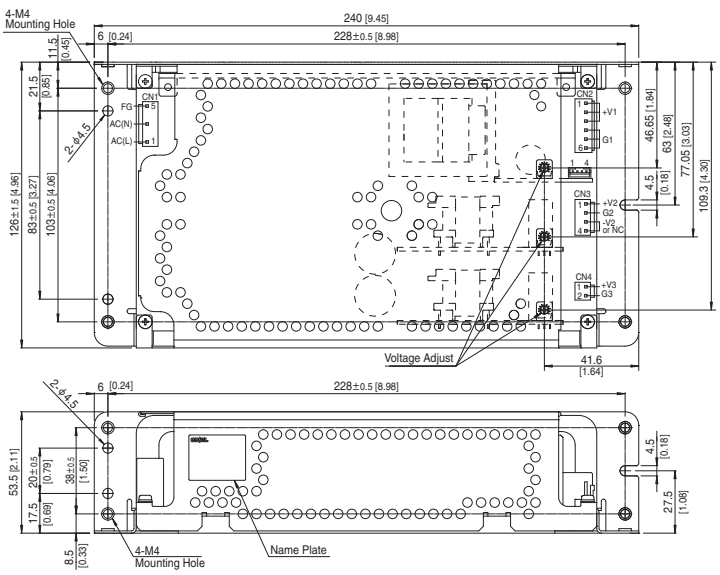
RBC300F external view

Standard type



※ Tolerance : ±1 [±0.04]
※ Weight : 710g max
※ There are a total of five attachment holes.
※ Dimensions in mm, [ ]=inches
※ Mounting torque : 0.6N·m max
※ PCB Material / thickness : FR-4 / 1.7mm [0.07]

Chassis and cover type



※ Tolerance : ±1 [±0.04]
※ Weight : 1260g max
※ There are a total of four attachment holes.
※ Dimensions in mm, [ ]=inches
※ Mounting torque (Mounting hole of chassis) : 1.5N·m max
※ PCB Material / thickness : FR-4 / 1.7mm [0.07]

I/O Connector		Mating connector	Terminal
CN1	B3P5-VH	VHR-5N	Chain : SVH-21T-P1.1 (AWG22～18) SVH-41T-P1.1 (AWG20～16) Loose : BVH-21T-P1.1 (AWG22～18) BVH-41T-P1.1 (AWG20～16)
CN2	B6P-VH	VHR-6N	
CN3	B4P-VH	VHR-4N	
CN4	B2P-VH	VHR-2N	
CN5 Optional	S4B-PH-K-S	PHR-4	Chain : SPH-002T-P0.5S Loose : BPH-002T-P0.5S

(Mfr : J.S.T.)

CN1

Pin No.	Input
1	AC (L)
2	-
3	AC (N)
4	-
5	FG

CN2

Pin No.	Output
1	+V1
2	
3	
4	G1
5	
6	

CN3

Pin No.	Output
1	+V2
2	G2
3	NC or -V2
4	

CN4

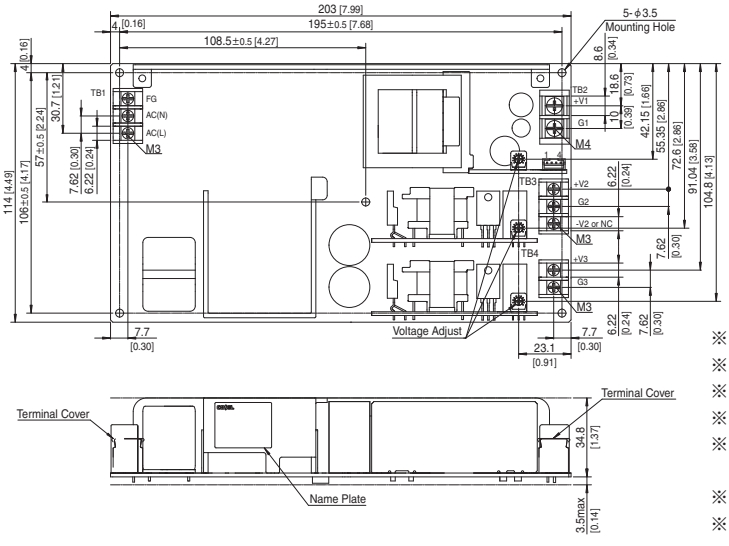
1	+V3
2	G3

CN5 (Optional)

Pin No.	Function
1	※1
2	
3	
4	

※1 The function of CN5 varies depending on optional. Please refer to the instruction manual.
※ Pin no.2 and 4 is NC at CN1.
※ Maximum current per contact at CN2 is 6A.
※ Pin no.3,4 of CN2 are NC when slot 2 module is single output.

Vertical terminal block type



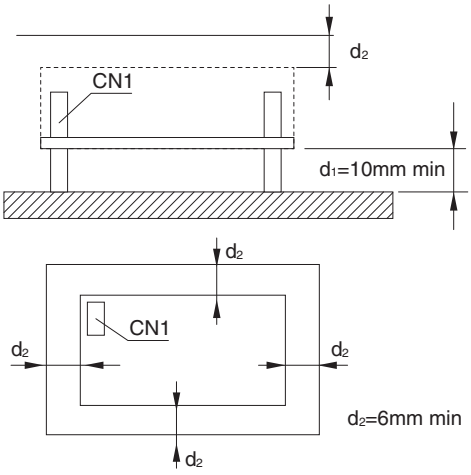
※ Tolerance : ±1 [±0.04]
※ Weight : 710g max
※ There are a total of five attachment holes.
※ Dimensions in mm, [ ]=inches
※ Screw tightening torque M3 : 0.8N·m max
M4 : 1.6N·m max
※ Mounting torque : 0.6N·m max
※ PCB Material / thickness : FR-4 / 1.7mm [0.07]

Assembling and Installation Method

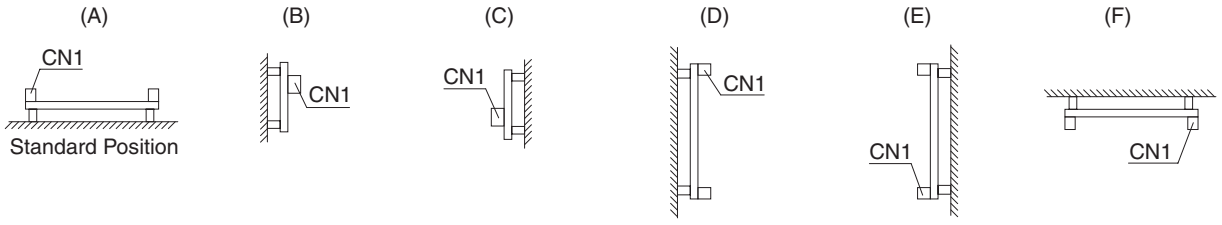
Mounting method

■This power supply is manufactured by SMD technology.
Do not touch any SMD components on the unit. Be especially careful when handling.

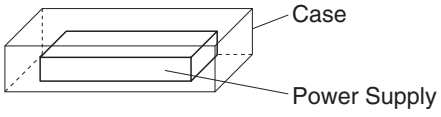
■If using a metal chassis, keep proper insulation between the component and metal chassis, use the spacer of 10mm or more between bottom of power supply and metal chassis.
If d1 and/or d2 are less than the value mentioned in right figure, insert an insulating sheet with reinforced insulation between the power supply unit and metal chassis.
The following distance is not satisfactory for cooling condition.
Please refer to "Derating" and Instraction Manual 4 for cooling method.



■Installation method shown below is possible.

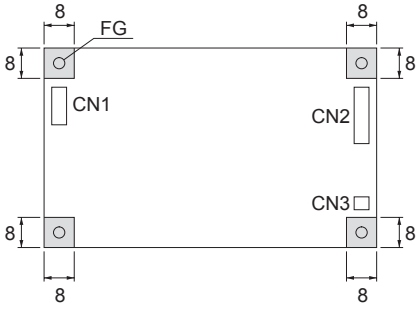


■There is a possibility that it is not possible to cool enough when the power supply is used by the sealing up space as showing in right figure.
Please use it after confirming the temperature of points 1 through 5 of Instraction Manual 4.

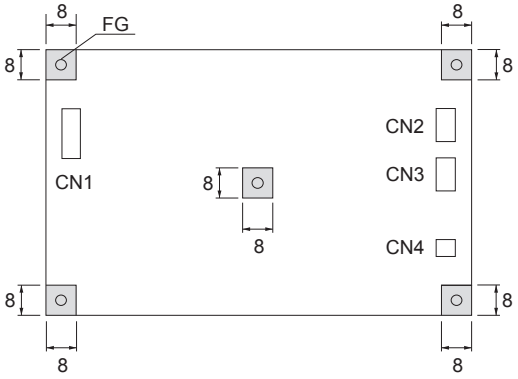


■The mounting screw should be M3. The hatched area shows the allowance of metal parts for mounting.

●RBC200F



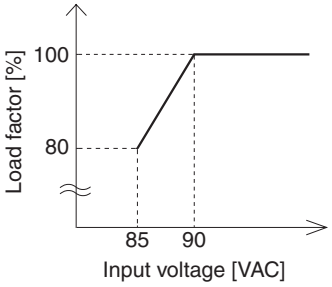
●RBC300F



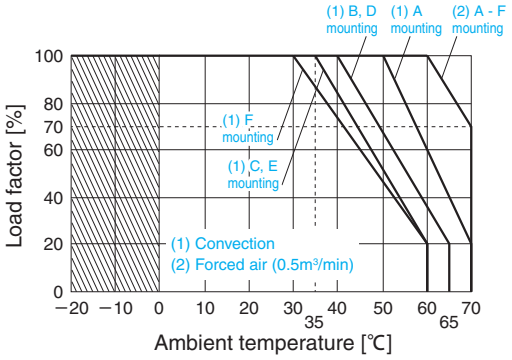
Derating

■Refer to the Instruction Manual 5 and 6 for the definition of load factor.

●Input Voltage Derating Curve



●Ambient Temperature Derating Curve (Reference value)



∗Specifications for ripple and ripple noise changes in the shaded area.

■Please make sure the maximum component temperature rise given in Instruction Manual 4 is not exceeded.

Instruction Manual

◆ It is neccessary to read the “Instruction Manual” and “Before using our product” before you use our product.

Instruction Manual https://en.cosel.co.jp/product/powersupply/RB/
Before using our product https://en.cosel.co.jp/technical/caution/index.html

RB NOTICE

Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A]	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
					Material	Single sided	Double sided	Series operation	Parallel operation
Input module of RBC200F	Active filter	40 - 220	2.4 ∗1	Relay	FR-4	-	Yes	No	No
Input module of RBC300F	Active filter	40 - 220	3.6 ∗1	Relay	FR-4	-	Yes	No	No
Output module of V, W, Y, Z	LLC resonant converter	90 - 180	-	-	FR-4	-	Yes	No	No
Output module of S, T, U	LLC resonant converter	60 - 200	-	-	FR-4	-	Yes	No	No
Output module of B, C, D, G, H, J, K, L	Flyback converter	60 - 120	-	-	FR-4	-	Yes	Yes ∗2	No
Output module of E, F, M, P, Q	Flyback converter	60 - 120	-	-	FR-4	-	Yes	No	No

∗1 The value at ACIN 100V and rated output.
∗2 Series operation is possible only if Slot 2 and Slot 3 are the same module. (Refer to Instruction Manual 3.1)